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Nos. 82-524, 82-545, 82-551

IN THE

Supreme Court of the United States

OCTOBER TERM, 1982

BALTIMORE GAS AND ELECTRIC COMPANY, *et al.*,
Petitioners,
v.
NATURAL RESOURCES DEFENSE COUNCIL, INC.,
Respondent,

UNITED STATES NUCLEAR REGULATORY COMMISSION AND UNITED STATES OF AMERICA,
Petitioners,
v.
NATURAL RESOURCES DEFENSE COUNCIL, INC., *et al.*,
Respondents,

COMMONWEALTH EDISON COMPANY, *et al.*,
Petitioners,
v.
NATURAL RESOURCES DEFENSE COUNCIL, INC., *et al.*,
Respondents.

On Petitions for a Writ of Certiorari to the United States Court of Appeals for the District of Columbia Circuit

MOTION FOR LEAVE TO FILE BRIEF AMICI CURIAE AND BRIEF OF LIMERICK ECOLOGY ACTION, INC. AND ENVIRONMENTAL COALITION ON NUCLEAR POWER AS AMICI CURIAE

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MOTION FOR LEAVE TO FILE BRIEF AMICI CURIAE IN SUPPORT OF NATURAL RESOURCES DEFENSE COUNCIL, INC.

AND NOW, come the Environmental Coalition on Nuclear Power and Limerick Ecology Action, Inc., by and through their counsel, and respectfully move your Honorable Court for leave to file a brief as Amici Curiae in the above matter in support of the Natural Resources Defense Council Inc., and set forth the following in support of this Motion:

Movants are the Environmental Coalition on Nuclear Power (ECNP) of State College, Pennsylvania and Limerick Ecology Action, Inc. (LEA) of Pottstown, Pennsylvania. ECNP and LEA are both non-profit public interest organizations sharing a common concern regarding the societal risks and costs associated with the nuclear fuel cycle and the operation of nuclear power plants sited in Pennsylvania. ECNP is a state-wide coalition of environmental groups, organized in 1970. LEA was also organized in 1970.

Both ECNP and LEA have intervened in the proceedings of the U.S. Nuclear Regulatory Commission (NRC) on the applications of Philadelphia Electric Company for a construction permit and operating

license for the Limerick Nuclear Generating Station sited near Philadelphia, Pennsylvania. Philadelphia Electric Company is a Petitioner in No. 82-524. In the construction permit proceeding, and in the operating license proceeding now pending before the NRC, LEA and ECNP raised issues relating to environmental review disclosures of nuclear waste disposal environmental costs and uncertainties. LEA has also raised issues relating to the use of probabilistic risk assessment techniques in environmental impact disclosures in the Limerick operating license proceeding. On February 15, 1983, the NRC Atomic Safety and Licensing Board denied a litigation contention related to Table S-3 on the basis of the NRC's Statement of Policy issued in response to the decision below in Natural Resources Defense Council, Inc. v. NRC et. al., 685 F2d 459 (1982). That policy statement instructed Commission licensing boards to proceed in reliance upon the Table S-3 rule, despite the defects in the Rule. 47 Fed. Reg. 50591-50593.

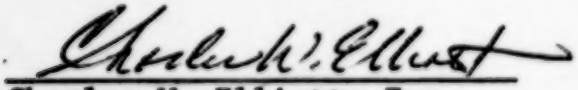
To date, the submissions of the parties have failed to focus on the implications of this case from the perspective of citizen intervenors in individual nuclear reactor licensing cases. They have failed to adequately address the falsehood of the Table S-3 "zero release" assumptions as factual findings, in light of recent Commission regulatory action. Further, the submissions have ignored the serious impact on the use of probabilistic risk assessment techniques in environmental impact disclosures which may result from a reversal of the decision below.

The United States, by letter dated December 23, 1982 from the Solicitor General, consented to the participation as amici curiae of ECNP and LEA. However, Philadelphia Electric Company, as Petitioner in No. 82-524, refused to consent.

WHEREFORE, the Environmental Coalition on Nuclear Power and Limerick Ecology Action Inc., respectfully request that your Honorable Court grant them

(e)

leave to file a brief as amici curiae, which brief is appended hereto.



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BRIEF OF THE ENVIRONMENTAL COALITION ON NUCLEAR POWER AND LIMERICK ECOLOGY ACTION, INC. AS AMICI CURIAE

INTEREST OF AMICI

Amici curiae are the Environmental Coalition on Nuclear Power (ECNP) of State College, Pennsylvania and Limerick Ecology Action, Inc. (LEA) of Pottstown,

Pennsylvania. ECNP and LEA are both non-profit public interest organizations sharing a common concern regarding the societal risks and costs associated with the nuclear fuel cycle and the operation of nuclear power plants sited in Pennsylvania. ECNP is a state-wide coalition of environmental groups, organized in 1970. LEA was also organized in 1970.

Both ECNP and LEA have intervened in the proceedings of the U.S. Nuclear Regulatory Commission (NRC) on the applications of Philadelphia Electric Company for a construction permit and operating license for the Limerick Nuclear Generating Station sited near Philadelphia, Pennsylvania. Philadelphia Electric Company is a Petitioner in No. 82-524. In the operating license proceeding now pending before the NRC, LEA and ECNP raised issues relating to environmental review disclosures of nuclear waste disposal environmental costs and uncertainties. LEA has also raised issues relating to the use of probabilistic risk assessment techniques in environmental impact disclosures in the Limerick operating license proceeding. On February 15, 1983, the NRC Atomic Safety and Licensing

Board denied a litigation contention related to Table S-3 on the basis of the NRC's Statement of Policy issued in response to the decision below in Natural Resources Defense Council, Inc. v. NRC et. al., 685 F2d 459 (1982). That policy statement instructed Commission licensing boards to proceed in reliance upon the Table S-3 rule, despite the defects in the Rule. 47 Fed. Reg. 50591-50593.

Amici curiae therefore have a vital interest in the matters now at issue.

SUMMARY OF ARGUMENT

I. The Table S-3 Rules neither disclose, nor otherwise permit consideration of forseeable and significant environmental impacts associated with the "disposal" of nuclear waste at a "final repository." Although grave uncertainty exists with respect to the siting and construction of any repository, the Rules nevertheless falsely treat total and isolation of nuclear waste forever as though it were a certainty. In fact, while the NRC assumes, for purposes of the Rules and its responsibilities under the National Environmental Policy Act (NEPA),

that there will be no releases of nuclear waste from such a repository, the Commission elsewhere has proposed technical criteria which will permit nuclear waste releases from a repository, which the EPA has calculated to result in human deaths and other health effects.

Even if these anticipated releases are not viewed as "permitted," or "planned," the Rules' exclusion in the licensing/NEPA review process of consideration of the uncertainty surrounding the siting of, construction of, and releases from, a waste repository violates NEPA. While the Petitioners' briefs assert that these uncertainties are not "sufficiently grave" to affect the licensing process, the Commission has made no such determination yet in an appropriate proceeding. In any event, the legitimacy of such an apriori determination is gravely dubious as it assigns a false zero weight to the decisionmaking cost of uncertainty, and thus eliminates an actual cost from the cost/benefit balance in the licensing of a nuclear reactor.

II. The effect of the original and interim S-3 rules also violated NEPA because (1) the rules did not disclose significant fuel cycle environmental impacts of human deaths, disease and other health effects, and socioeconomic and cumulative impacts of the nuclear fuel cycle, and (2) the origin and procedural application of the three S-3 rules effectively precluded consideration of those effects in the licensing process. The Petitioners' arguments that no preclusive effect was intended, and that such effects were not considered because they were considered "insignificant," are merely post hoc rationalizations. Those rationalizations are belied by the Commission's own statements at the time it issued a rule amendment to permit such effects to be considered, in which the Commission admitted that the rules had been interpreted as precluding such consideration.

III. The Petitioners would also require an improper truncation of NEPA disclosure and consideration of significant environmental impacts identified by probabilistic risk assessment (PRA)

techniques. Petitioners argue that NEPA requires the prediction of future impacts of a proposed action in terms of "the" environmental impact. However, the Commission has recognized the importance of perceiving such future impacts as a spectrum of consequences and their associated probabilities. The process suggested by Petitioners of taking only the impact which the "probabilities favor" would permit a disregard of significant environmental risks which have been identified by the Commission.

ARGUMENT

I. THE TABLE S-3 RULE'S EXCLUSION OF FORSEEABLE NUCLEAR WASTE ENVIRONMENTAL IMPACTS AND CONSIDERATION OF UNCERTAINTIES VIOLATES THE MANDATE OF THE NATIONAL ENVIRONMENTAL POLICY ACT.

The continuing reluctance of the United States Nuclear Regulatory Commission to disclose to the public, and to permit its decisionmakers to adequately consider, the full environmental impact of nuclear waste disposal brings this matter to the Court once more.

When this Court considered Table S-3 in 1978, it noted with approval the finding by the Court of Appeals that:

> decisions to license nuclear reactors which generate large amounts of toxic wastes requiring special isolation from the environment for several centuries are a paradigm of "irreversible and irretrievable committments of resources" which must receive "detailed" analysis under §102 (2)(C)(v) of NEPA. Natural Resources Defense Council, Inc. v. Nuclear Regulatory Commission, 178 U.S. App. D.C. 336, 344, 547 F2d 633, 641 (1976).

For years, the NRC (or its predecessor, The Atomic Energy Commission) had ignored the obvious fact that each decision to license a nuclear reactor implicated a decision to "turn the wheel" of the nuclear fuel cycle which supports reactor operation. At that time, its environmental impact statements for nuclear reactors failed to consider at all the impact of the fuel cycle including waste disposal, attributable to that reactor.

Finally, and belatedly, the Commission has conceded that these impacts must be considered at the time a decision to create nuclear wastes is made. But the Commission nevertheless persists in seeking to exclude from such timely consideration most serious environmental costs which elsewhere it admits will occur.

In the licensing of each reactor, the Commission attempts to weigh the costs of construction and operation of the reactor against the benefits which they may create. A reactor can be licensed only if the Commission concludes that the benefits "outweigh" the costs.

The validity of such a cost/benefit analysis depends upon the Commission's willingness and ability to consider fully, appropriately, and adequately all of the costs and all of the benefits of the proposed action.

Among the costs of reactor licensing is the need to isolate from human beings the hundreds of tons of highly radioactive and toxic reactor waste which will pose a public health threat for thousands of years.

In each reactor licensing proceeding, Table S-3 is the chief device employed by the Commission to disclose, for purposes of The National Environmental Policy Act, what the environmental cost will be of the existence of this enormous quantity of nuclear waste.

The Commission has assumed in its Table S-3 that there will be no environmental/health impact from this nuclear waste once it is placed in the ground. This is the "zero-release assumption". The Commission makes this assumption for NEPA purposes despite the fact there yet exists no place on earth in which to place these wastes, that the

wastes will pose a health hazard for more years than any human civiliation has existed, and despite uncertainties in human knowledge so extensive that indeed we do not yet even know how deep is our ignorance.

This Court's decision in Vermont Yankee[1] censured the practice of asserting a particular position in one forum, while adopting another elsewhere.[2] While the Commission here offers its reassurances that "probabilities favor" the zero-release assumption, it elsewhere promulgated criteria which would permit the release of significant quantities of nuclear waste into the accessible environment.

Despite the Table S-3 assumption of the "perfect" repository, when the time came to propose how a repository should actually be built, the Commission was forced to admit its disingenous optimism:

> The Commission neither intends nor expects either containment

1. Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519 (1978).

2. The Court stated that parties "changed positions as nimbly as if dancing a quadrille". 435 U.S. at 539-40

> to be lost completely at the end of 1,000 years following emplacement or the engineered system's contribution to the control of wastes to cease abruptly at some later time. However, the Commission recognizes that at some point the design capabilities of the engineered system will be lost and that the geologic setting - the site - must provide the isolation of the wastes from the environment... The Commission also recognizes that isolation is, in fact, a controlled release to the environment which could span many thousands of years, and that the release of radionuclides and the potential exposures to individuals which could result, should be addressed in the evaluation of a repository.[1]

The NRC technical criteria for a repository permit, and indeed plan for, a specified release rate of radiation into the accessible environment and human radiation exposures in magnitudes that the EPA will approve. See U.S. Nuclear Regulatory Commission, "Disposal of High Level Radioactive Wastes in Geologic Repositories", (Proposed Rule) 46 Fed.

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1. U.S. Nuclear Regulatory Commission, "Disposal of High Level Radioactive Wastes in Geological Depositories: Proposed Rule", 46 Fed. Reg. 35282 (1981).

Reg. 35281, 35289 (1981).

In a parallel action, the EPA has proposed standards which will permit repository releases to cause numerous fatal cancers over time. The projected number of health effects depends upon which assumptions and " reference cases" are applied. The maximum expected impact from a repository in compliance with the regulations is "estimated to be less than 1,000 premature cancer deaths over the first 10,000 years for disposal... The environmental impact of the alternatives [EPA] considered range up to about 10 times as large as this." See U.S. Environmental Protection Agency, "Environmental Standards for Management and Disposal of Spent Nuclear Fuel, High Level and Transuranic Radioactive Wastes ",EPA 520/1-82-025 (1982).

These expected impacts have not been considered in any nuclear reactor environmental review because, to date, the Commission has relied upon its zero-release NEPA assumption. For a decade now the Commission has persisted in arguing, for NEPA purposes only, that these releases and exposures to human beings will not exist let alone be regulatorily

permitted.

Yet it is fundamental NEPA jurisprudence that an agency must consider environmental impacts that are "reasonably forseeable." See Scientists for Public Information, Inc. v. Atomic Energy Commission, 481 F2d 1079, 1092 (1973); Carolina Environmental Study Group v. United States of America, 570 F2d 796, 798 (1975).

It is apparent that total isolation of nuclear waste from the environment is neither the policy, nor the regulatory standard, nor the expectation of the Commission. Indeed, as Judge Edwards perceived, "neither the Commission nor the Commission staff really defend the zero-release conclusion for any purpose other than to prevent discussion of the issue at licensing hearings." 685 F2d at 503.

Recognizing its inability to defend the assumption, the Commission's defense of the preclusive effect of the rule rests upon a conceptual sleight-of-hand. The "zero-release assumption" is now characterized by the Commission not as a finding of "fact", but rather as an

"administrative decision-making device."

The only "decision" which the "device" implements is a decision to exclude any consideration in the licensing process of any environmental impact of post-burial waste repository releases. The Commission argues that it was entitled to make that decision as a matter of policy, and that this policy rests upon its conclusion that "the uncertainties...[of nuclear waste disposal] are not sufficiently grave to be decisive in any individual reactor licensing proceeding...[.]" NRC Brief, p. 27. This argument echoes the statement of the Commission in its Petition for Writ of Certiorari, that "the NRC, by contrast, concluded that whatever uncertainty attended the disposal problem should not be a reason for withholding a license in any individual case." NRC Petition, p. 14.

The Commission's recent regulatory permission of waste releases from a repository demonstrates that there is no longer uncertainty as to whether there will be such waste releases which will affect the environment, but only uncertainty as to how much the impact will be.

Even if the releases are viewed not as "expected", or "planned", but merely as "uncertain", the policy decision to exclude that "uncertainty" also violates NEPA. Before the Court of Appeals, the NRDC argued that the rule violated NEPA because it failed to "disclose the substantial uncertainties surrounding the numerical values set forth in the Table." Natural Resources Defense Council, Inc. v. U.S. NRC, No. 74-1586, Brief for Petitioner, p. 31.

Indeed, the table does not reflect those uncertainties, and the Rule does not permit consideration of them.

But the record does not support the assertion by the Commission that it has actually concluded that the uncertainties of nuclear waste disposal cannot be decisive in any reactor licensing proceeding.[1]

Instead, as the court below

1. The Commission cannot point to any legal proceeding in which this conclusion was reached. Instead, it points to a proposed Appendix to Table S-3 (46 Fed. Reg. 15154, at 15155) which has not yet been adopted.

stated:

> After recognizing that there are uncertainties concerning the permanent storage of nuclear wastes, the Commission simply ruled that licensing decisions should be made on the basis of cost/benefit analyses that omitted the costs represented by these uncertainties. It did not rule that the costs were insignificant, nor did it rule that they were outweighed by generic benefits that would also be excluded from licensing board consideration. 685 F2d at 483.

In its Petition for Writ of Certiorari the Commission tried to evade this problem by arguing that NEPA did not require the performance of cost/benefit analyses. Petition, p. 17. Yet cost/benefit analyses were chosen by the Commission to implement its NEPA responsibilities. See 10 CFR §§51.20(b), 51.23(c), 51.26(a).

In employing such analyses for its NEPA review, the Commission must not falsely exaggerate benefits, nor exclude costs, in order to justify the proposed action. Where the quantified value of the cost (zero) is known to be false, and the extent of the falsity is open to grave uncertainty which cannot be quanti-

fied, the uncertainty must surely be considered.

Valid cost/benefit balances must consider all actual costs and benefits of whatever nature, despite the fact that some may not be quantifiable in the usual sense. In response to one suggestion of the Court of Appeals that perhaps the uncertainties may be accounted for by employing "fictional values", the Commission states that it is "impossible to believe that in enacting Section 102 (2)(C) Congress 'mandated' a 'decisionmaking structure' using 'fictional values'." NRC Brief, p. 35.

We agree. But it is the value which is under review in this case - the "zero-release" value - that is the most fictional possible.

Judge Wilkey's dissent rests upon a fundamental misconception of the effect of the rule in precluding consideration of the uncertainties:

> No fair reading of the Commission's stated intent at this time supports Judge Bazelon's conclusion that "The Commission's final rule, like its two predecessors, does not permit licensing boards to consider either the risk that permanent

> waste management facilities will not be developed, or the risk that they will fail to perform as intended if they are developed." 685 F2d at 530 f. 84.

More recent Commission action contradicts Judge Wilkey's view, and clarifies that the final rule, like the original and interim rules, prohibits consideration of uncertainties.

In response to the decision below, the Commission's policy statement required its licensing boards to continue "in reliance" upon the Final S-3 rule, and stated that certain procedural disadvantages would be created by moving "further toward case by case litigation" of fuel cycle impacts. It then stated:

> The same result would follow if the Commission amended the rule to allow Licensing Boards to take evidence on uncertainties in the Table S-3 entries... 47 Fed. Reg. 50592 n. 7.

Indeed, in the Limerick proceeding, based upon that policy statement, the Licensing Board refused to consider a contention that mere references to Table S-3 inadequately considered the uncertainties in high-level waste disposal. In re Philadelphia Electric Co., (Limerick Generating

Station), "Memorandum and Order Rejecting Table S-3 Fuel Cycle Contention", February 10, 1983 (unpublished).

It is clear, therefore, that the Final rule, like the original and interim rules,[1] is being interpreted to prohibit consideration of uncertainties.

All the Petitioners below argued nevertheless that this exclusion was proper because of the supposed "conservatism" of the values selected. NRC

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1. There can be no question but that the interim rule was uniformly interpreted to prohibit consideration of uncertainties:

> Conclusions
> Table S-3 identifies solidified high level wastes as buried at a Federal repository, and under the rule, no release to the environment is associated with such disposal. In licensing proceedings conducted during the period of the interim rule, this is the impact to be attributed to such waste, which is to be used without further consideration of uncertainties in those values.

"NRC Staff Views on Consideration of Uncertainties In Use of Values Set Forth in Table S-3 of 10 CFR Part 51", Vermont Yankee Nuclear Power Station, et. al. Docket No. 50-271 (consolidated proceeding involving 13 licensees/applicants) (1977).

Brief, p. 13, p. 38-39; BG&E Brief, p. 12-13. The Petitioners imply that because the values for gaseous and volatile releases from the fuel to be buried are intentionally "overestimated" (assumed to be released prior to burial) the solidified waste releases over time can be ignored.

The two major radionuclides which the Table assumes to be released prior to burial are krypton-85 and tritium. They have relatively short half-lives and therefore will decay to negligible levels within relatively short time periods. These elements are also of quite low radiotoxicity. However, there is a substantial imbalance between the amount of radioactivity assumed to be released prior to burial (some 400,000 curies) and the millions of curies to be buried. In addition, the elements to be buried are also thousands of times more toxic than krypton or tritium. Petitioner Baltimore Gas and Electric Co. argues that the table is conservative because two of the radionuclides assumed released prior to burial contribute more than 95% of the health effects associated with a long

term repository." BG&E Brief, p. 13, n. 28.

This health effects "conservatism" argument is disingenuous at best. Krypton-85 and tritium contribute "more than 95%" of the health effects only if we continue to assume that only gaseous and volatile elements are released, i.e., if we continue to use the very zero-release value challenged here for all of the other much more environmentally persistent and toxic radionuclides in the waste. Plutonium-239, for example, has a half-life approximately 2,500 times as long as krypton-85 or tritium, and is thousands of times more toxic. Iodine-129 has a half-life of 16 million years.

Without this zero-release assumption, other studies show that solid radionuclides such as americium-241 and 243 may dominate health effects. See, Environmental Protection Agency, "Environmental Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes" EPA 520/1-82-025 (Dec. 1982), p. 204. The NRC has incorporated in its proposed regulations on high level waste disposal those EPA proposed standards which will

permit the release of such radionuclides into the accessible environment. See, U.S. Nuclear Regulatory Commission, "Disposal of High Level Radioactive Wastes in Geologic Repositories," (Proposed Rule) 46 Fed. Reg. 35280-96.

The amount of those releases to be permitted, and the number of health effects projected, depend further upon uncertainties. An actual repository will release those limited amounts only if it is sited and constructed to conform to the NRC/EPA criteria. The health effects projections recited above depend upon geologic stability, assumptions regarding geochemical retardation factors, whether each final repository is actually built in salt or whether it is constructed in granite, and numerous other "uncertainties". Given other assumptions, the EPA projects some 38,000 health effects over 10,000 years. See, U.S. EPA, supra, p. 103.

The limits of our ability to accurately make such predictions, and the significant gaps in human knowledge in this area cannot be gainsaid. The obligation of the Commission under NEPA is

to consider, "to the fullest extent possible" the environmental impact of the proposed action. Section 102 (2)(C), National Environmental Policy Act of 1969, 42 USC §4332 (2)(C).

That Congressional mandate requires that the environmental impact disclosures prescribed by NEPA be permitted to have an impact on the actual decision to license a nuclear reactor, thus "assur[ing] the integrity of the...[process] by precluding stubborn problems or serious criticisms from being swept under the rug." Silva v. Lynn, 482 F2d 1282, 1285 (1st Cir. 1973).

To this date, each decision to create nuclear wastes by issuing licenses for nuclear reactors has been made without regard to the possibility, now clearly "foreseeable," that human deaths will result from waste repository releases. While this issue has been cast in terms of "uncertainty," the uncertainty remaining is in the precise number of casualties which might be expected. While the Commission asserts these effects to be "insignificant" they are surely not without any weight. They may no longer be disregarded in determining whether the benefits of reactor operation will outweigh its costs.

II. THE PRECLUSIVE EFFECT OF THE ORIGINAL AND INTERIM RULES WITH RESPECT TO HEALTH, SOCIOECONOMIC AND CUMULATIVE EFFECTS VIOLATED NEPA.

As the Court of Appeals correctly noted below,

> The original rule and the interim rule, prior to its amendment stated that "the contribution of the environmental effects of... fuel cycle activities shall be as set forth in the following Table S-3 ...[and] no further discussion of such environmental effects shall be required."[1] Therefore, the rules unambiguously stated that a licensing board's consideration and an EIS's disclosure of the environmental effects of fuel-cycle activities could be limited to the information contained within the four corners of Table S-3. Moreover, it appears that the impact of the rules was to preclude further consideration or disclosure. 685 F2d at 488.

No decision of the Commission appears to the contrary. The rule's provision that "no further discussion shall be required" was always interpreted as a prohibition.

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1. See, 39 Fed. Reg. 14188, 14191 (1974); 42 Fed. Reg. 13803, 13806 (1977).

Indeed, the Commission had admitted that this interpretation was the practice:

> This point needs emphasis in view of the background of the Commission's original S-3 rule, which at least initially was interpreted as cutting off further discussion of fuel cycle impacts. 44 Fed. Reg. 45363-4.

The Commission stated that "it might fairly be concluded" from the original rule that this interpretation was correct, and acknowledged that

> In particular, impact statements prepared by the staff did not analyze fuel cycle impacts in terms of health effects which might be caused by the radioactive releases tabulated in the rule and did not discuss socio-economic or cumulative impacts.[1] Id. at 45364 col. 23.

Indeed, the Commission's own Appeal Board noted the preclusive effect of the original and interim rules:

> Those regulations were construed in prior decisions, first, to limit consideration of the envi-

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1. Note bene, that the Commission did not offer as a reason for this failure the "insignificance" of those impacts. The Commission's recent explanation that insignificance was the reason the impacts were not discussed (NRC Brief, p. 47) is a post hoc rationalization.

> ronmental effects of the uranium fuel cycle in individual licensing proceedings to the values set out in Table S-3.

Tennesee Valley Authority (Hartsville Nuclear Plant) 5 NRC 92, 105 (1977).

Indeed, up to the final rule amendment of 1978, the procedural patchwork created by the original and interim rules foreclosed consideration of fuel cycle health effects, socio-economic impacts, (and, of course, uncertainties in those values) in individual licensing cases.

In the proceedings on the application of Philadelphia Electric Co. for a construction permit for the Limerick nuclear facility, the original Environmental Impact Statement prepared by the AEC staff contained no consideration whatsoever of the nuclear fuel cycle. See, U.S. Atomic Energy Commission,"Final Environmental Statement Related to the Proposed Limerick Generating Station," Docket Nos. 50-352, 50-353 (November 1973).

In April of 1973, ECNP and LEA, amici curiae herein, had contended in that proceeding that

> Applicant has failed to include in the Environmental Impact Statement

> the cost/benefit and risk/benefit analysis of those aspects of the complete uranium fuel cycle that follow the use of the fuel rods, particularly environmental effects associated with transportation, reprocessing and high level radioactive waste storage and monitoring [emphasis added].

LEA, ECNP, "Environmental Contentions", Philadelphia Electric Co. (Limerick), Docket Nos. 50-352, 353. (filed April 30, 1973).

When the original rule requiring fuel cycle impact considerations was promulgated in 1974, the Commission deemed the values of the original Table S-3 (without consideration of health effects and uncertainties), to be insufficient to change the decision to issue a license. Environmental impact statements circulated prior to the effective date of the rule, (such as Limerick's) were exempted. See, 39 Fed. Reg. 14190, col. 2-3. The 1974 decision to issue a construction permit for Limerick was issued without regard to the fuel cycle impacts, and certainly did not include consideration of fuel cycle health effects, and uncertainties. On appeal, the Appeal Board considered an exception to that decision, in which the inadequacy of the consideration of fuel

cycle effects in the environmental impact statement was raised. See, Philadelphia Electric Co., (Limerick) Docket No. 352, 353, ALAB Order of July 26, 1974 (unpublished).

In its decision of March 19, 1975, the Appeal Board affirmed the issuance of the construction permit. Because by the time of its decision, the Commission had issued its first fuel cycle rule, the Appeal Board factored in the original S-3 values and concluded that the addition of those values (again, without any consideration of health effects, socio-economic costs, or the uncertainty of waste disposal, or post-burial repository releases) did not affect the outcome. Philadelphia Electric Company, (Limerick) NRCI - 75/3, p. 163, at 204 (1975).

Still believing that NEPA had not been complied with, ECNP, uncounselled but undaunted, filed a document complaining inter alia, that the cost/benefit analysis was defective in its consideration of the problem of waste disposal. "Petition for Intervention" [sic] July 1976, p. 2. The next year, the Commission issued its new interim rule, with some

changes. But the only issue opened up by the Commission was whether the new values in the interim S-3 rule would tip the cost/benefit balance against the reactors. Vermont Yankee Nuclear Power Corporation, et. al., (consolidated proceeding) CLI 77-10, 5 NRC 717 (1977), at 717 (b). In that consolidated proceeding, the Commission recognized that even the "small" difference in values between the original and interim rules might, (although it believed unlikely) tilt the cost/benefit balance against a nuclear facility. 5 NRC at 717 (b). It directed the Appeal Board to review the cost/benefit balance only to the extent of adding the new interim values. Again, no consideration was given to health effects, socioeconomic effects, uncertainties, or post-burial repository releases.

During all this time, construction of the facility was permitted to proceed.

In response to the Commission directive to the Appeal Board, the Board noted that the more construction was completed, the "smaller the probability that the numerical values assigned to the environmental effects of the uranium fuel

cycle could have the effect of tipping the overall cost/benefit balance against the facility." Vermont Yankee Nuclear Power Corporation et.al. (consolidated proceeding) ALAB-392, 5 NRC 759, at 763.

But with respect to that probability, the Board noted that not all members of the Board were in agreement as to the "degree of likelihood that Table S-3 as revised by the interim rule might tip the balance against any particular facility." Id., at 765. This strongly hinted that such a tipping of the scales was in fact quite possible.

Still, there was no consideration of health effects or uncertainties of waste disposal.

Finally, in 1977, in Public Service Gas and Electric Co. (Salem) et. al. (consolidated proceeding) ALAB-426, 6 NRC 206 (1977) the Appeal Board affirmed the cost/benefit analyses for 11 facilities, including Limerick, concluding that with reference to facilities that are "either fully constructed and operational or well along the road to completion", the new values were not weighty enough to tip the cost/benefit scale.

Again, no consideration was taken of health effects, or uncertainties, or post-burial releases - only the interim "values".

Thus, despite the fact that the Commission's Boards reviewed the cost/benefit balance for Limerick and other facilities no less than three times, and each time had before them assertions that the cost/benefit analysis had not adequately addressed the fuel cycle impacts and problem of nuclear waste disposal, still no consideration of any health effects was made.

The Licensing and Appeal Boards either ignored these issues, or believed themselves precluded by Commission regulations from considering them.

In response to the attacks made upon the validity of such regulations, the Commission issued its "final" S-3 rule. That rule, for the first time, stated that the environmental analyses must take into account fuel cycle health effects, and socioeconomic effects.

And now, before this Court, in an astonishing attempt to revise history, the Commission argues that the original and interim rules permitted

consideration of such effects, and that the 1978 final rule merely made its previous "permission" "more explicit". NRC Brief, p. 47.

The reason the Boards did not take into account fuel cycle health effects (i.e. the human deaths and genetic damage associated with radiation exposure) the Commission now says, is because they were "insignificant." NRC Brief, p. 47.

If so, then there was no sense in the Commission's remand of 11 consolidated cases to the Appeal Board for a detailed consideration of the "small" change in values of the releases which would have represented only a portion of the total fuel cycle health effects.

Instead, the Commission's contemporaneous explanation for the new rule requiring consideration of health effects was indeed that Commission licensing practice with reference to the original rule was to interpret it as cutting off discussion of fuel cycle impacts beyond the values in the rule. 44 Fed. Reg. 45363-4.

Thus, the procedural history of the rule itself, and its application in

individual licensing proceedings, belie the Commission's new explanations, of its "permission."

Baltimore Gas and Electric, et. al., in No. 82-524 have argued that NEPA does not require the disclosure of environmental impacts "in terms of human health and the environment and in terms that a court will find to be understandable to a layman." Petition for Writ of Certiorari, pp. i, 21-22.

They complain that the Court of Appeals found fault only "with how the Commission has disclosed the potential environmental impacts of the fuel cycle, not with whether it has disclosed those potential impacts," thus, "improperly intruding upon the discretion of the agency under NEPA to determine the 'form' of disclosure." Petition, p. 21. See also, BG&E Brief, p. 34-35.

While the argument is beguiling, it is untrue. NEPA requires disclosure of environmental impacts. While the mere release of various radioactive gases and volatile substances into the air, water and soil are an "impact," the mere presence of those radionuclides is not

the only "impact," nor the more significant. Radioactive substances act on human beings by penetrating human tissue with ionizing radiation, causing disease and genetic damage. See, e.g., The Advisory Committee on the Biological Effects of Ionizing Radiation, BEIR-I-III, "The Effects on Populations of Exposure to Low-levels of Ionizing Radiation, Academy of Sciences (1972,1979,1980). The mere presence per se in the environment of substances which cannot be detected by the human senses is not the significant impact for human beings. The only significance of the releases is the disease, genetic damage, and deaths they will cause.

This is not merely a requirement that the impacts be disclosed in terms "understandable to a layman." These health effects are themselves impacts which are not disclosed by mere digits representing the number of curies of radioactivity released.

The Petitioners in 82-524 also suggest that, in any event, these health effects need not be disclosed because the Commission has "tentatively determined" that these health effects are

"insignificant."

Such a determination (which has not yet been made by the Commission) would amount to a conclusion that the acreage of land expected to be temporarily disturbed by fuel cycle activities is significant enough to be disclosed in Table S-3 (See Table S-3, 10 CFR § 51.20) but that the number of human deaths and genetic effects caused by fuel cycle activities is not so significant. Indeed, there exists a serious question of whether such a determination would be lawful. Then-Commissioner Peter Bradford commented on the proposal that:

> I do not agree with the Commission's proposal to prohibit consideration of fuel cycle impacts in individual license proceedings. By this proposal, the Commission is finding as a matter of law that the deaths which may be caused by the fuel cycle may not be considered in a federal decision on whether or not to license a plant. The narrative itself estimates these

> possible deaths to number 484 over 150 years[1]...This finding means that if a viable alternative, which was not expected to kill, were otherwise equal on a cost-benefit basis with a reactor, the Commission would ignore the alternative's lack of human casualties." 46 Fed. Reg. 15175.

It is the NEPA responsibility of the Commission, not intervenors or other parties, to disclose and assess all significant environmental impacts. The original and interim Table S-3 rules neither disclosed, nor permitted cost/benefit consideration of the health effects of fuel cycle activities in each individual nuclear reactor licensing decision.

The Commission may not lawfully utterly avoid such assessment by consigning human deaths to a matter of regulatory indifference.

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1. This estimation also depends upon the assumption of zero-releases of radionuclides from a repository once it has been sealed. The proposed Appendix recites: "it is assumed that there will be no release of solid radionuclides to the environment from buried solid waste materials... It is assumed that the geologic repository will be designed and operated so that the solid radioactive wastes are confined indefinitely." 46 Fed. Reg. 15165, col. 1.2.

III. THE TRUNCATION OF DISCLOSURES OF ENVIRONMENTAL IMPACTS IDENTIFIED THROUGH RISK ASSESSMENT TECHNIQUES WOULD FRUSTRATE THE PURPOSES OF NEPA.

Petitioners complain that the Court of Appeals required environmental review procedures beyond those required by NEPA:

> The procedural obligation to trace and report every conceivable environmental contingency and determine its probability of occurrence and severity of potential effect cannot be found in the "reasoned decisionmaking" requirement of the [Administrative Procedure Act].
>
> . . .
>
> Neither NEPA nor the APA requires agencies to demonstrate that they have conducted detailed probabilistic analyses.

BG&E Brief, p. 33.

But neither can one find such a "procedural obligation" in the decision of the Court of Appeals below. The court below did not impose upon the Commission an obligation to conduct probabilistic risk analyses. It concluded only that while an agency may assess an uncertain environmental effect generally, it may not then prescribe that individual EISs reflect "only a most probable - or modal-value for the effect." 685 F2d at 485, n. 137.

The Commission recognizes that with respect to prediction of future events, isolation of one "value" as "the" environmental "impact" of an action is unrealistic and simplistic:

> The Reactor Safety Study and NRC experience... has served to refocus attention on the need to reemphasize that environmental risk entails both probabilities and consequences, a point that... was not given adequate emphasis.

U.S. Nuclear Regulatory Commission, "Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969," 45 Fed. Reg. 40101, at 40102.

The Commission has recognized that enviromental risks are in fact environmental impacts, for NEPA purposes:

> It is the position of the Commission that its Environmental Impact Statements, pursuant to Section 102 (c)(i) of the National Environmental Policy Act of 1969 shall include a reasoned consideration of the environmental risks (impacts) attributable to accidents at the particular facility or facilities within the scope of each such statement. In the analysis and discussion of such risks, approximately equal attention shall be given to the

> probability of occurrence of releases and to the probability of occurrence of the environmental consequences of those releases... The environmental consequences of releases whose probability of occurrence has been estimated shall also be discussed in probabilistic terms.

Id., p. 40103, col. 1-2.

As a matter of practice, the Commission is employing these techniques for NEPA purposes already:

> [T]he Commission is aware that there are...many uncertainties in the application of risk assessment methods, and it expects that its Environmental Impact Statements will identify major uncertainties in its probabilistic estimates. On the other hand the Commission believes that the state of the art is sufficiently advanced that a beginning should now be made in the use of these methodologies in the regulatory process, and that such use will represent a constructive and rational forward step in the discharge of its responsibilities.

Id., at 40103, col. 2.

While NEPA may not require the agency to perform detailed probabilistic risk analyses, it does require the disclosure and consideration of significant environmental impacts. Thus, as the Commission recognizes environmental risks to represent environmental impacts, NEPA requires disclosure of significant environmental risks.

Therefore, once the Commission has performed such a risk assessment and as a result of that assessment has identified significant environmental risks, it must disclose and consider those risks in its licensing actions.

The use of probabilistic risk assessments has educated us to the reality that in making present predictions of events in futuro, there is no "one" impact which can be isolated and judged to be "the" impact. The future is instead a spectrum of possibilities, some significant and some not.

The Court of Appeals merely held that "improbable yet potentially severe environmental damage is as much an environmental cost as certain or probable damage, and to allow decisions to be

made without consideration of any significant - even if probabilistic - environmental effect constitutes a violation of NEPA." 685 F2d at 485, f. 137.

"Significant" is the crucial expression. If an event is of relatively low consequence, its "significance" increases as the probability of its occurrence nears certitude. Similarly, the "significance" of an event of relatively low probability increases as its consequences increase in severity. For NEPA purposes, the Commission may disregard the risk of a future event only if it reaches a reasoned conclusion that such a risk is "insignificant", i.e., of sufficiently low probability and consequence that it may be disregarded.

It may not truncate the disclosure by merely selecting the "more probable" event, and utterly ignoring extremely high consequence events, thus effectively treating their probability as "zero", if their probability is not zero.

The Petitioners' argument that an "agency must exercise judgment and select from the spectrum of potential 'risks'

the one which the agency believes represents the environmental impact of the proposal" (BG&E, Brief, p. 25-26) authorizes the agency to select "one impact" and ignore all other significant impacts.

Rejection of that argument does not mean that the agency is compelled to address every "conceivable" impact, nor does it suggest that the agency may not exercise its expert judgment.

The agency's discretion to ignore impacts however, is circumscribed by its NEPA obligation to disclose and consider significant impacts. Only after it has exercised its expert judgment in accordance with NEPA and reasonably determined the impact to be "insignificant" may it disregard risks.

The approach suggested by Petitioners would subvert the NEPA goal of realistic disclosure.[1]

1. The process suggested by NRDC, and amici, does not require use of "worst case" values or the improper "elevation" of environmental considerations, contrary to this Court's decision in Strycker's Bay Environmental Council v. Karlen, 444 U.S. 223 (1980). The Court of Appeals did not dictate that "worst case" values be used as "the" environmental impact. If

(footnote con't. on p. 43.)

CONCLUSION

Had a malevolent deity set out to test our system for overseeing technological decisions, he would have enabled the creation of a technology with overwhelming military importance, distanced its underlying physical laws from ordinary experience, given it attractive commercial applications, and designed those applications to endanger public health. Moreover, he would have acted at a time of sensitivity to threats to national security, when the legitimacy of administrative government had been settled, and after economic, military, and social crises had encouraged unquestioning faith in the efficiency and dispassion of government experts. Under these circumstances he could have been confident of an extraordinarily deferential judiciary and could have expected technological enthusiasm to overshadow the constraints of legislative oversight and safety regulations. The development of nuclear power has

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(f. cont'd. from p.42).

the spectrum of risks is disclosed, with the consequence and probability set forth as the Commission emphasized, then any "worst case" will be discounted by its (hopefully) low probability, thus assigning an appropriate weight to the effects.

> posed precisely such a test. The experience has been uncomfortable, and some no doubt regret it. But the data it provides cannot be ignored, for they suggest there are inherent weaknesses that prevent existing institutions from adequately controlling the risks that flow from technological decisions.
>
> . . .
>
> The Supreme Court has not consistently applied a doctrine of noninterference in the setting of agency procedures, but if Vermont Yankee nevertheless is read as closing the procedural door, the remaining route to assuring carefully reasoned, technically defensible agency decisions is explicitly substantive.[1] [footnote omitted].

This case presents the last opportunity to assure Commission compliance with the Congressional mandate of full environmental review in a matter of enormous societal importance, that has long evaded such review.

The decision below is consistent with this Court's directive in Vermont Yankee Nuclear Power Corporation v. NRDC, 435 U.S. 519 (1978) to afford the case a

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1. Yellin, Joel, "High Technology and the Courts: Nuclear Power and the Need for Institutional Reform," 94 Harvard Law Rev. 489 (1981) at 490, 452.

substantive review under the Administrative Procedure Act, it properly and effectively implements the purposes of the National Environmental Policy Act, and it permits appropriate Commission discretion in performing its NEPA responsibilities.

The decision of the Court of Appeals should be affirmed in all respects.

Respectfully submitted,

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